

### **What is Claimed is:**

1. A photocatalyst carrier, comprising:  
a carrier, made of an electric conductive material and having a surface; and  
5 a photocatalyst, unevenly coated on said surface to form a plurality of photocatalyst electrodes.
2. The photocatalyst carrier of claim 1, wherein a reactant comes into contact with said carrier and said photocatalyst electrode alternatively while flowing across said photocatalyst carrier.
- 10 3. The photocatalyst carrier of claim 1, wherein said photocatalyst is coated onto said surface in a meshed form for enabling a predetermined interval to be disposed between said plural photocatalyst electrodes.
4. The photocatalyst carrier of claim 1, wherein each photocatalyst electrode is a bar shape coated onto said surface and each photocatalyst  
15 electrode is separated by an predetermined distance.
5. The photocatalyst carrier of claim 1, wherein said photocatalyst electrode has a shape selected from the following: a circular, a rectangular, a rhombus, and a polygon.
6. The photocatalyst carrier of claim 1, wherein said carrier is made of a  
20 material selected from the following: copper, iron, aluminum, and electric conductive glass.
7. The photocatalyst carrier of claim 1, wherein said carrier is made of a semiconductor.
8. The photocatalyst carrier of claim 1, wherein said photocatalyst  
25 containing of one of the following materials: titanium (Ti), zinc (Zn), tungsten (W), tin (Sn), chromium (Cr), tantalum (Ta), and zirconium (Zr).
9. The photocatalyst carrier of claim 1, wherein said carrier is a rectangular board.

10. The photocatalyst carrier of claim 1, wherein said carrier has a second surface being coated unevenly with the photocatalyst for forming a plurality of photocatalyst electrodes disposed thereon.

11. The photocatalyst carrier of claim 1, wherein said carrier is a tubular object having a cross section in one of the following shapes: a circular shape, an oval shape, and a parabolic shape.

12. The photocatalyst carrier of claim 1, wherein said photocatalyst is coated using one of the following methods: a plasma sputtering method, a sol-gel processing method, and an adhesive coating method.

13. The photocatalyst carrier of claim 12, capable of being applied to a photoconversion system, the photoconversion system including:

said photocatalyst carrier;

a light source, illuminating said photocatalyst carrier for exciting said photocatalyst coated on said surface to perform an electron-hole separation;

and

at least one reactant, being in contact with said surface to perform an oxidation-reduction reaction with said electron-hole.